

1 of 1 DOCUMENT

UNITED STATES PATENT AND TRADEMARK OFFICE GRANTED PATENT

5642985

July 1, 1997

Swept turbomachinery blade

REISSUE: June 30, 1999 - Reissue Application filed Jun. 30, 1999 (O.G. Aug. 24, 1999) Ex. Gp.: 3745; Re. S.N. 09/343,736 August 24, 1999; June 5, 2001 - Reissue Application filed Ex. Gp.: 3745; Re. S.N. 09/874,931 May 14, 2002

APPL-NO: 08559965

FILED-DATE: November 17, 1995

GRANTED-DATE: July 1, 1997

Selected file: PLUSPAT

** SS 1: Results 1

1 / 1 PLUSPAT - @QUESTEL-ORBIT
PN - US5642985 A 19970701 [US5642985]
TI - (A) Swept turbomachinery blade
PA - (A) UNITED TECHNOLOGIES CORP (US)
IN - (A) BIEDERMAN BRUCE P (US); SPEAR DAVID A (US); OROSA JOHN A (US)
AP - US55996595 19951117 [1995US-0559965]
PR - US55996595 19951117 [1995US-0559965]
IC - (A) F01D-005/14
EC - F01D-005/14B
F04D-029/32B3
F04D-029/38C
F04D-029/38C2
PCL - ORIGINAL (O) : 416238000; CROSS-REFERENCE (X) : 415181000
416242000
DT - Corresponding document
CT - US1964525; US2154313; US2915238; US2934259; US2935246; US3416725;
US3444817; US3692425; US3989406; US4012172; US4358246; US4408957;
US4726737; US4737077; US4784575; US5112192; US5167489; SU1528965
STG - (A) United States patent
AB - A swept turbomachinery blade for use in a cascade of such blades
is disclosed. The blade (12) has an airfoil (22) uniquely swept so
that an endwall shock (64) of limited radial extent and a passage
shock (66) are coincident and a working medium (48) flowing
through interblade passages (50) is subjected to a single
coincident shock rather than the individual shocks. In one
embodiment of the invention the forwardmost extremity of the
airfoil defines an inner transition point (40) located at an inner
transition radius r_t -inner. The sweep angle of the airfoil is
nondecreasing with increasing radius from the inner transition
radius to an outer transition radius r_t -outer, radially inward of
the airfoil tip (26), and is nonincreasing with increasing radius
between the outer transition radius and the airfoil tip.

1 / 1 LGST - @LEGSTAT
PN - US 5642985 [US5642985]
AP - US 559965/95 19951117 [1995US-0559965]
DT - US-P
ACT - 19951117 US/AE-A
APPLICATION DATA (PATENT)
US 559965/95 19951117 [1995US-0559965]

19951117 US/AS02
ASSIGNMENT OF ASSIGNOR'S INTEREST
UNITED TECHNOLOGIES CORPORATION 1 FINANCIAL PLAZA HARTFORD,
CONNECTICUT 60191 * SPEAR, DAVID A. : 19951018; BIEDERMAN, BRUCE
P. : 19951109; OROSA, JOHN A. : 19951102

19970701 US/A
PATENT

19990824 US/RF
REISSUE APPLICATION FILED
19990630

20020514 US/RF

REISSUE APPLICATION FILED
20010605
UP - 2002-22

1 / 1 CRXX - @CLAIMS/RRX
PN - 5,642,985 A 19970701 [US5642985]
PA - United Technologies Corp
ACT - 19990630 REISSUE REQUESTED
ISSUE DATE OF O.G.: 19990824
REISSUE REQUEST NUMBER: 09/343736
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 3745

Reissue Patent Number:

20010605 REISSUE REQUESTED
ISSUE DATE OF O.G.: 20020514
REISSUE REQUEST NUMBER: 09/874931
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 3745

Reissue Patent Number:

1 / 2 PAST - @Thomson Derwent
AN - 200220-001726
PN - 5642985 A [US5642985]
OG - 2002-05-14
ACT - REISSUE APPLICATION FILED

2 / 2 PAST - @Thomson Derwent
AN - 199934-001367
PN - 5642985 A [US5642985]
OG - 1999-08-24
ACT - REISSUE APPLICATION FILED

Selected file: INPADOC

** SS 1: Results 5

1 / 5 INPADOC - @INPADOC
PN - EP 1138877 A1 20011004 [EP1138877]
TI - SWEPT TURBOMACHINERY BLADE
LA - ENG
IN - SPEAR DAVID A [US]; BIEDERMAN BRUCE P [US]; OROSA JOHN A [US]
PA - UNITED TECHNOLOGIES CORP [US]
AP - EP 1112128/01-A 19961115 [2001EP-1112128]
PR - EP 96308303/96-A3 19961115 [1996EP-0308303]
US 559965/95-A 19951117 [1995US-0559965]
IC - F01D-005/14; F04D-029/38
DS - DE* FR* GB*

1 / 2 LEGALI - @LEGSTAT
PN - EP 1138877 [EP1138877]
AP - EP 01112128/01 19961115 [2001EP-0112128]
DT - EP-P

ACTE - 19961115 EP/AE-A
EP-APPLICATION
EP 01112128/01 19961115 [2001EP-0112128]

20011004 EP/AC-P
DIVISIONAL APPLICATION (ART. 76) OF:
(EP 774567 20011004 [EP-774567])

20011004 EP/AK-A1 [+]
DESIGNATED CONTRACTING STATES IN AN APPLICATION WITH SEARCH
REPORT:
DE FR GB

20011004 EP/A1 [+]
PUBLICATION OF APPLICATION WITH SEARCH REPORT

20011114 EP/RIN1
INVENTOR (CORRECTION)
SPEAR, DAVID A. * BIEDERMAN, BRUCE P. * OROSA, JOHN A.

20020605 EP/17P [+]
REQUEST FOR EXAMINATION FILED
20020327

20020626 EP/AKX [+]
PAYMENT OF DESIGNATION FEES
DE FR GB
UP - 2002-26

2 / 2 LEGALI - @LEGSTAT
PN - EP 774567 [EP-774567]
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19970521 EP/AK-A1 [+]
DESIGNATED CONTRACTING STATES IN AN APPLICATION WITH SEARCH
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PUBLICATION OF APPLICATION WITH SEARCH REPORT

19970903 EP/17P [+]
REQUEST FOR EXAMINATION FILED
970705

19981111 EP/17Q [+]
FIRST EXAMINATION REPORT
980924

20011004 EP/AH-P
DIVISIONAL APPLICATION (ART. 76) IN:
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20020626 EP/AK-B1 [+]
DESIGNATED CONTRACTING STATES MENTIONED IN A PATENT
SPECIFICATION:
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PATENT SPECIFICATION
UP - 2002-26

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PN - EP 774567 A1 19970521 [EP-774567]
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IC - F01D-005/14; F04D-029/38
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PN - EP 1138877 [EP1138877]
AP - EP 01112128/01 19961115 [2001EP-0112128]
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20020626 EP/B1 [+]
PATENT SPECIFICATION
UP - 2002-26

4 / 5 INPADOC - @INPADOC
PN - JP 9184451 A2 19970715 [JP09184451]
TI - TURBO MACHINE BLADE
IN - DEIBITSUDO EI SUPIA; BURUUSU PII BIIDAAMAN; JIYON EI OROOSA
PA - UNITED TECHNOLOGIES CORP
AP - JP 301416/96-A 19961113 [1996JP-0301416]
PR - US 559965/95-A 19951117 [1995US-0559965]
IC - F02K-003/06; F01D-005/14

5 / 5 INPADOC - @INPADOC
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P. : 19951109; OROSA, JOHN A. : 19951102

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20020514 US/RF
REISSUE APPLICATION FILED
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UP - 2002-22

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